PART 1

INTRODUCTION

CHAPTER 1

What Is Evidence-Based Physical Diagnosis?

When clinicians diagnose disease, their intent is to place the patient's experience into a particular category (or diagnosis), a process implying specific pathogenesis, prognosis, and treatment. This procedure allows clinicians to explain what is happening to patients and to identify the best way to restore the patient's health. A century ago, such categorization of disease rested almost entirely on empiric observation—what clinicians saw, heard, and felt at the patient's bedside. Although some technologic testing was available then (e.g., microscopic examination of sputum and urine), its role in diagnosis was meager, and almost all diagnoses were based on traditional examination (Fig. 1.1). For example, if patients presented a century ago with complaints of fever and cough, the diagnosis of lobar pneumonia rested on the presence of the characteristic findings of pneumonia—fever, tachycardia, tachypnea, grunting respirations, cyanosis, diminished excursion of the affected side, dullness to percussion, increased tactile fremitus, diminished breath sounds (and later bronchial breath sounds), abnormalities of vocal resonance (bronchophony, pectoriloquy, and egophony), and crackles. If these findings were absent, the patient did *not* have pneumonia. Chest radiography played no role in diagnosis because it was not widely available until the early 1900s.

Modern medicine, of course, relies on technology much more than medicine did a century ago (to our patients' advantage), and for many modern categories of disease, the diagnostic standard is a technologic test (see Fig. 1.1). For example, if patients present today with fever and cough, the diagnosis of pneumonia is based on the presence of an infiltrate on the chest radiograph. Similarly, the diagnosis of systolic murmurs depends on echocardiography and that of ascites on abdominal ultrasonography. In these disorders, the clinician's principal interest is the result of the technologic test, and decisions about treatment depend much more on that result than on whether the patient exhibits egophony, radiation of the murmur into the neck, or shifting dullness. This reliance on technology creates tension for medical students, who spend hours mastering the traditional examination yet later learn (when first appearing on hospital wards) that the traditional examination pales in importance compared to technology, a realization prompting a fundamental

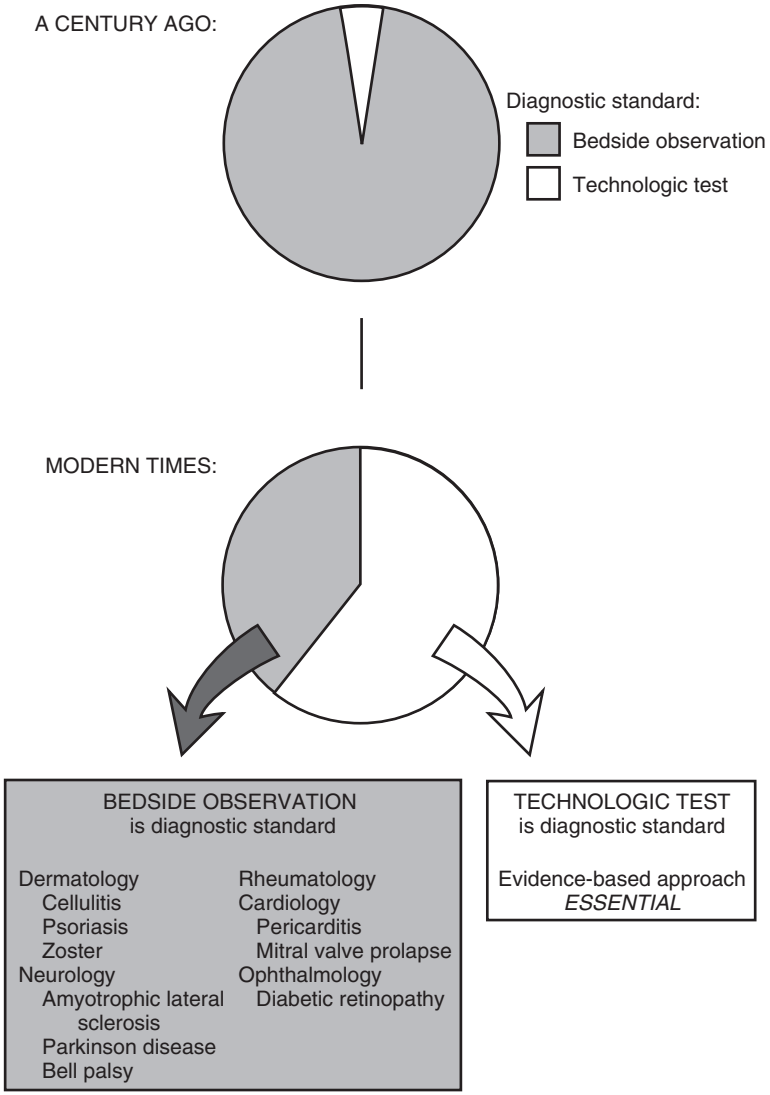

FIG. 1.1 EVOLUTION OF THE DIAGNOSTIC STANDARD. This figure compares the diagnostic process one century ago (*top*, before introduction of clinical imaging and modern laboratory testing) to modern times (*bottom*), illustrating the relative contributions of bedside examination (*gray shade*) and technologic tests (*white shade*) to the diagnostic standard. One century ago, most diagnoses were defined by bedside observation, whereas today technologic standards have a much greater diagnostic role. Nonetheless, there are many examples today of diagnoses based solely on bedside findings (examples appear in the *large gray shaded box*). Evidence-based physical diagnosis, on the other hand, principally addresses those diagnoses *defined by technologic standards*, because it identifies those traditional findings that accurately predict the result of the technologic test, as discussed throughout this book.

question: What is the true diagnostic value of the traditional physical examination? Is it outdated and best discarded? Is it completely accurate and underutilized? Is the truth somewhere between these two extremes?

Examination of Fig. 1.1 indicates that diagnosis today is split into two parts. For some categories of disease, the diagnostic standard still remains empiric observation—what the clinician sees, hears, and feels—just as it was for all diagnoses a century ago. For example, how does a clinician know the patient has cellulitis? The only way is to go to the patient's bedside and observe fever and localized bright erythema, warmth, swelling, and tenderness on the leg. There is no other way to make this diagnosis (technologic or not). Similarly, there is no technologic standard for Parkinson disease (during the patient's life), Bell palsy, or pericarditis. All of these diagnoses—and many others in the fields of dermatology, neurology, musculoskeletal medicine, and ophthalmology—are based entirely on empiric observation by experienced clinicians; technology has a subordinate diagnostic role. In fact, the principal reason medical students still must study and master the traditional examination is the dependence of many diagnoses on bedside findings.

The principal role of evidence-based physical examination, in contrast, is the second category of diseases—that is, those whose categorization today is based on technologic studies. Clinicians want to know the results of a chest radiograph when diagnosing pneumonia, an echocardiogram when diagnosing systolic murmurs, and an ultrasound when diagnosing ascites. For each of these problems, the evidence-based approach compares traditional findings to the technologic standard and then identifies those findings that increase or decrease the probability of disease (as defined by the technologic standard), distinguishing them from unhelpful findings that fail to change probability. Using this approach, the clinician will calculate the Heckerling score* to predict the findings of the chest radiograph (Chapter 32), define the topographic distribution of the murmur on the chest wall to predict the findings of the echocardiogram (Chapter 43), and look for a fluid wave or edema to predict the findings of the abdominal ultrasound examination (Chapter 51).

There are thus two distinct ways physical examination is applied at the bedside. For many disorders—those still lacking a technologic standard—the clinician's observations define diagnosis. For other disorders—those based on technologic tests—the clinician's application of an evidence-based approach quickly identifies the relatively few findings that predict the results of technologic standard. Both approaches to bedside examination make physical examination more efficient, accurate, and ultimately more relevant to the care of patients.

* The Heckerling score assigns one point to each of five independent predictors of pneumonia that are present: temperature greater than 37.8° C, heart rate greater than 100 beats per minute, crackles, diminished breath sounds, and absence of asthma (see Chapter 32).